

THE THE AND THE
GOOD BAD UGLY :

Evaluating Open Science Practices in Academic Research



Alessio Palmisano
University of Turin
Department of Historical Studies

Layout

- Open Science and Open Access
- Open Data
- Open Methods
- Open Publishing
- Solutions



UNIVERSITÀ
DI TORINO

What is Open Science?



UNIVERSITÀ
DI TORINO

*“to make the primary outputs of **publicly funded** research results – publications and the research data – **publicly accessible** in digital format with no or minimal restriction”*

OECD, 2015, p.7. Making Open Science a Reality

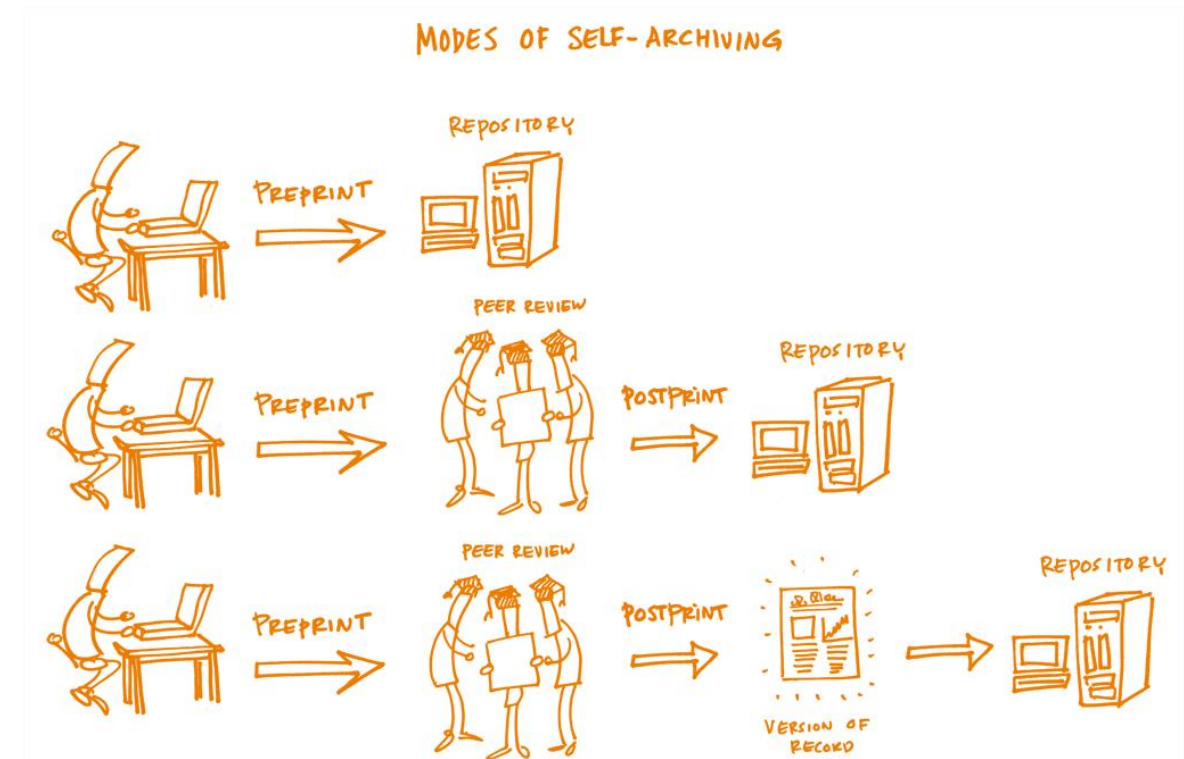


*“Removing access **barriers** to this literature will accelerate **research**, enrich **education**, share the **learning** of the rich with the poor and the poor with the rich, make this literature as useful as it can be, and **lay the foundation for uniting humanity** in a common intellectual conversation”*

Two recommended strategies:

➤ Self-archiving

➤ Open-Access Journals



“Open access is not an end in itself, but a means to further ends. Above all, it is a means to the **equity, quality, usability, and sustainability** of **research**. Our four high-level recommendations address systemic problems that obstruct progress toward these ends.”

Four recommended strategies:

- Host OA research on **open infrastructure**.
- **Reform** research assessment and rewards to improve incentives.
- Promote models which benefit **all regions of the world**, which are controlled by academic-led and non-profit organizations.
- Favour **inclusive publishing** and distribution channels that never exclude authors on economic grounds.

Open Access Policies

To promote the openness, accessibility, usability, interoperability, citizens engagement and inclusivity.



UNIVERSITÀ
DI TORINO

Open Research Europe

Benefits for
Researchers



Boost the credibility of your research

Open data enables replication and validation of your research, which in turn boosts its credibility and robustness. By sharing your data openly, your entire research project becomes more transparent (and satisfies funder requirements, to boot).



Enhance the visibility of your work

Increase the discoverability of your research by reciprocally linking your article and its related datasets. Plus, describing your data with rich, meaningful, machine-readable metadata makes it easy for humans (and computers!) to find and use.



Progress in your career

Researchers can benefit from increased credit and recognition for their outputs by sharing their research data, which in turn may lead to increased opportunities for collaboration – even across disciplines. Plus, one 2019 study suggests that open data can generate up to **25% more citations!**



Develop a better understanding of your field

Open data supports learning and enables a deeper, richer understanding of the research topic – this is particularly useful in teaching, as students are able to interrogate raw research data for themselves.



Open Access Policies

To promote the openness, accessibility, usability, interoperability, citizens engagement and inclusivity.



UNIVERSITÀ
DI TORINO

Open Data Charter
(2015)

OpenAIRE communication
infrastructure
(2018)

EAA Code of
Practice
(2022)

The **FAIR** (Findability,
Accessibility, Interoperability,
and Reusability) guiding
principles
(2016)

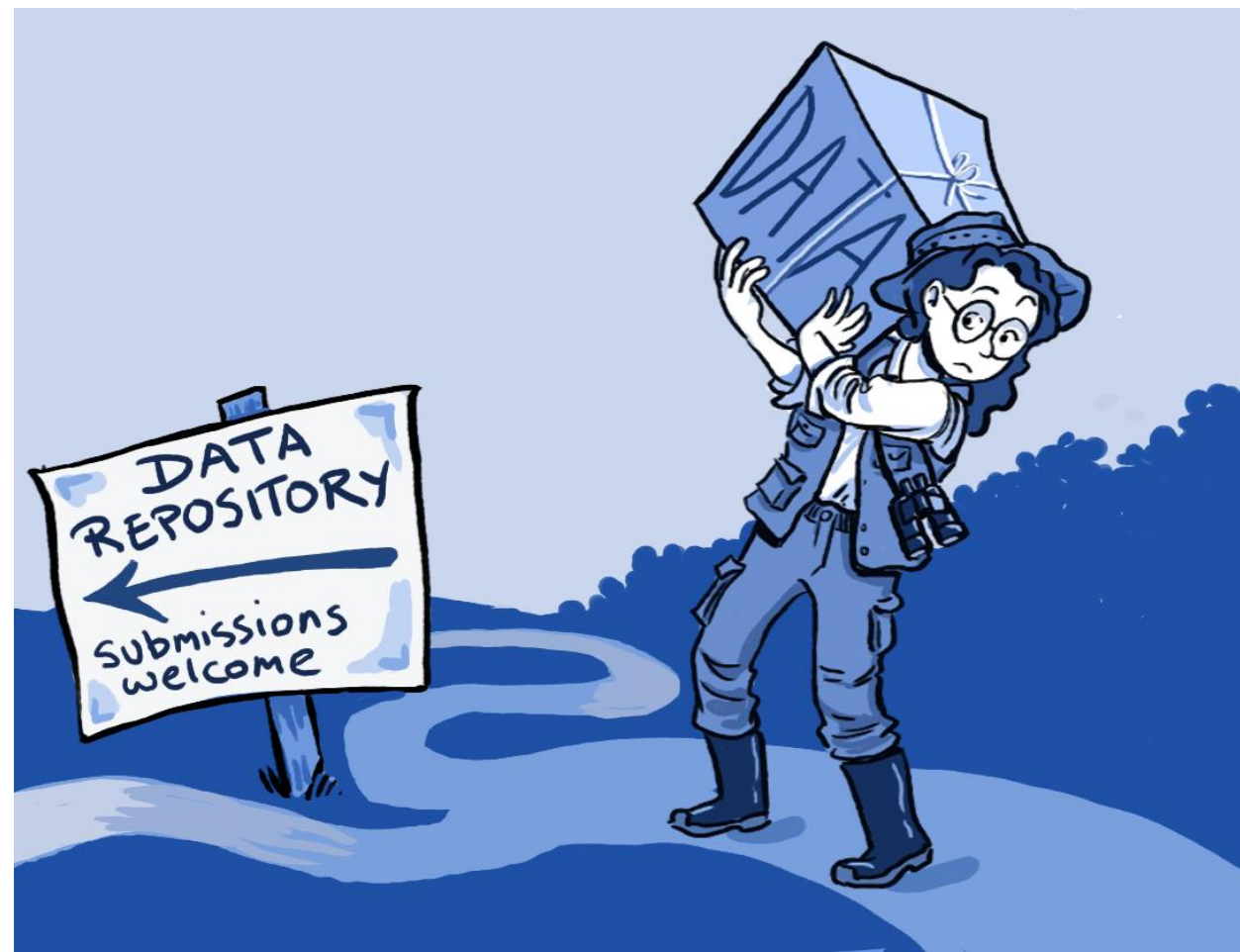
UNESCO
Recommendation on
Open Science
(2021)

What OA Implications in Archaeology



UNIVERSITÀ
DI TORINO

- The **preservation** of archaeological sites
- The **respect** of values held by specific local communities
- The enhance of **digital divide**
- Scientific **publications modalities**
- Data “**plagiarism**”



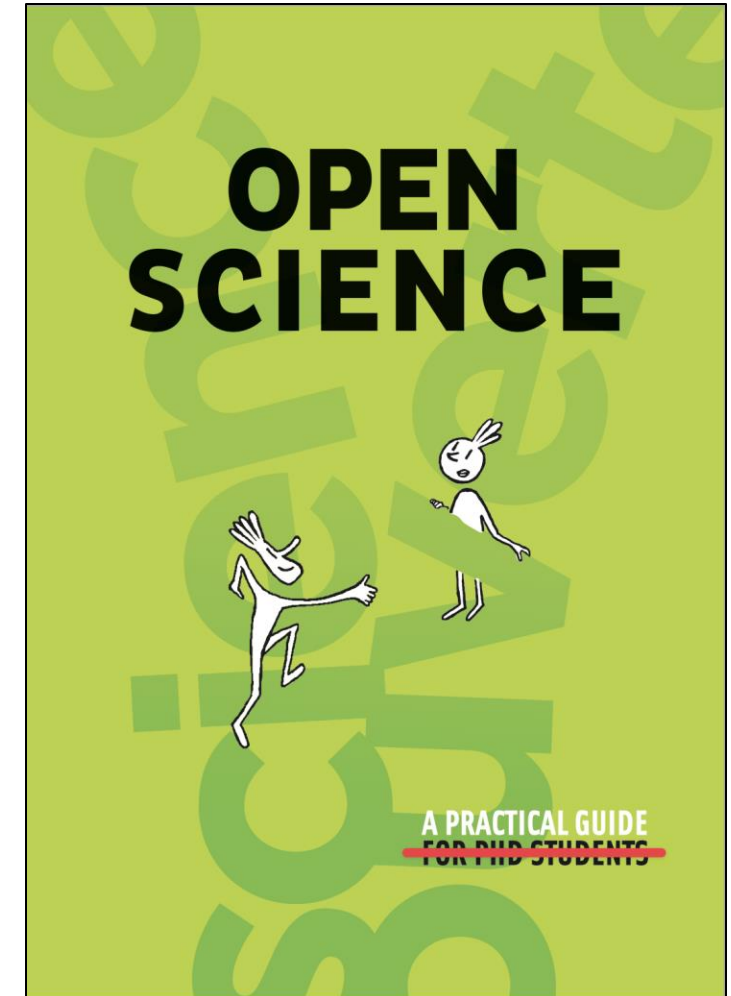
By Ainsley Seago (2014) CC BY 4.0

What Next ?



UNIVERSITÀ
DI TORINO

- Developing a “**protocol**” of good Open Science practices
- **Training** to Open Access principles
- **Citizen archaeology**
- **Collaborative** research platforms



Open Science in practice



UNIVERSITÀ
DI TORINO

OS has been proposed as a sort of **corrective** for some of the issues highlighted above and it aims to promote:

- **Transparency**
 - **Equity**
- **Inclusiveness**
- **Collaboration**

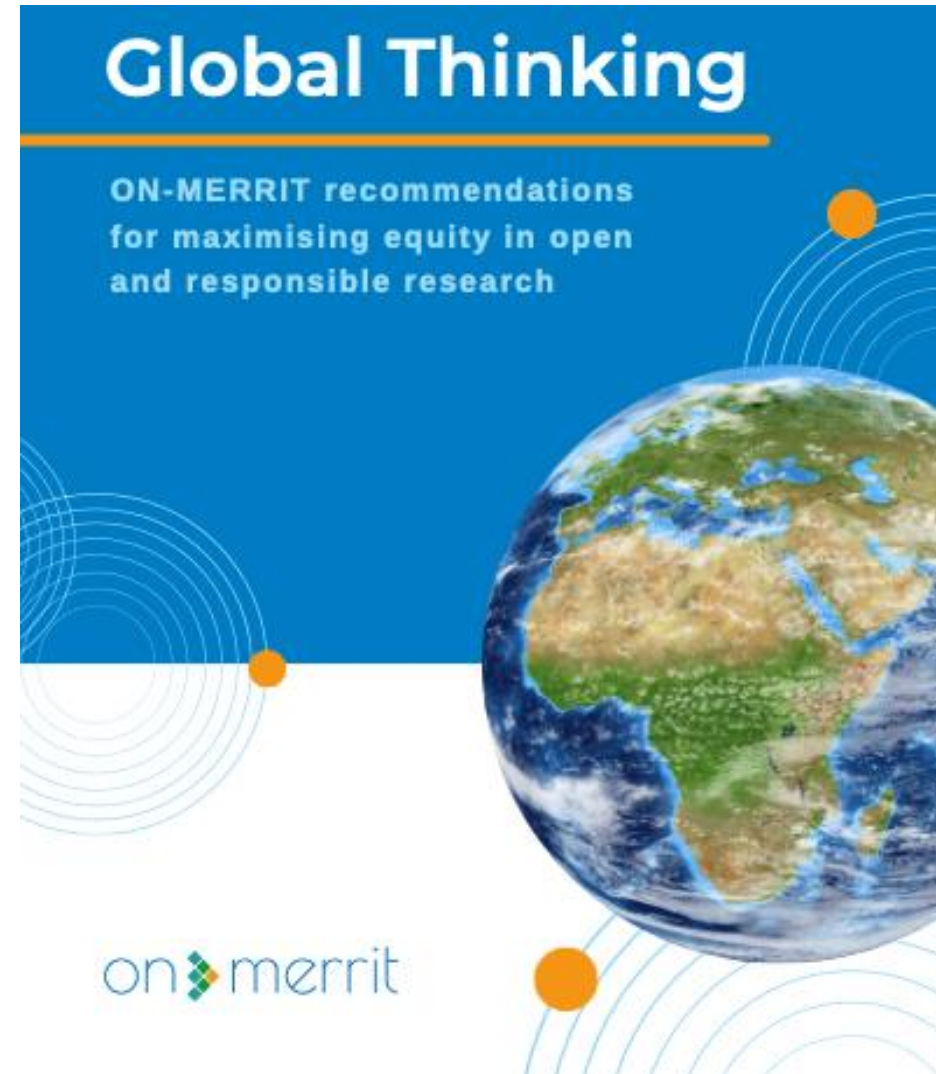
It can be perceived as a **movement**, a **goal**, a **framework** of policies, or even a **research strategy** (Fecher and Friesike 2014).

Open Science in practice



UNIVERSITÀ
DI TORINO

The project ON-MERRIT highlighted that the implementation of OS practices has **widened** existing **disparities** between **rich** and **poor** research institutions and published **a set of recommendations** for maximising equity in open research. <https://on-merrit.eu/>



Cole, N. L., Reichmann, S., & Ross-Hellauer, T. (2022). Global Thinking. ON-MERRIT recommendations for maximising equity in open and responsible research (1.0). Zenodo. <https://doi.org/10.5281/zenodo.6276753>

The Data Deluge

In recent years, archaeology has experienced an increasingly availability of open access digital data.



- Foster **interdisciplinary** approaches
- Easy access to **reusable** data
- **Reproducibility** of analyses (workflows, programming scripts, etc.)

**Open
Data**

General repositories



Archaeology repositories



Institutional repositories















Databases





Creative Commons (CC) license


A CC license is used when an author wants to give other people the right to share, use, and build upon a work that the author has created.


CREATIVE COMMONS LICENSES		 COPY & PUBLISH	 ATTRIBUTION REQUIRED	 COMMERCIAL USE	 MODIFY & ADAPT	 CHANGE LICENSE
	CC BY	✓	✓	✓	✓	✓
	CC BY-SA	✓	✓	✓	✓	✗
	CC BY-ND	✓	✓	✓	✗	✓
	CC BY-NC	✓	✓	✗	✓	✓
	CC BY-NC-SA	✓	✓	✗	✓	✗
	CC BY-NC-ND	✓	✓	✗	✗	✓

 You can redistribute (copy, publish, display, communicate, etc.)

 You have to attribute the original work

 You can use the work commercially

 You can modify and adapt the original work

 You can choose license type for your adaptations of the work.



Attribution

Others can copy, distribute, display, perform and remix your work if they credit your name as requested by you



No Derivative Works

Others can only copy, distribute, display or perform verbatim copies of your work



Share Alike

Others can distribute your work only under a license identical to the one you have chosen for your work



Non-Commercial

Others can copy, distribute, display, perform or remix your work but for non-commercial purposes only.


Online Databases

<https://pleiades.stoa.org/>

[skip to search form](#)

PLEIADES

[home](#)[places](#)[credits](#)[participate](#)[blog](#)[documentation](#)[downloads](#)



search for places

Start typing a name, Pleiades ID, or URL

or try an [advanced search](#)

https://survey.antiquities.org.il/index_Eng.html#/


The Archaeological Survey of Israel



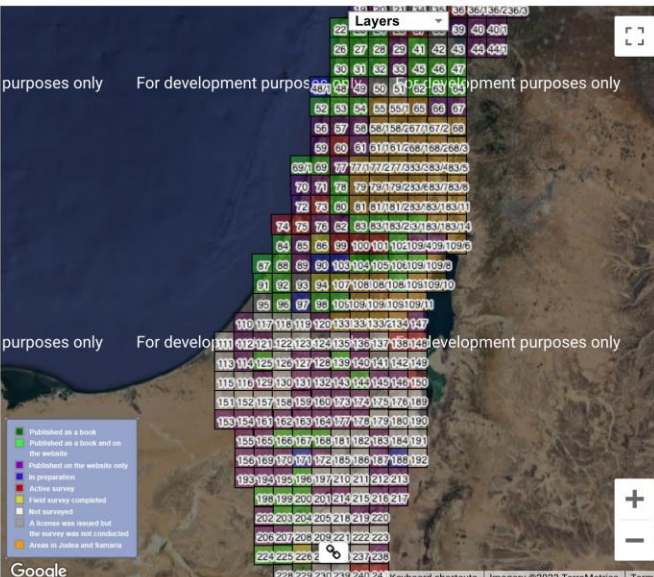
[Home](#)[Map surveys](#)[Development surveys](#)[Golan survey - Intro](#)[Arava survey - Intro](#)[QSearch](#)[Hebrew](#)

Welcome to Israel Antiquities Authority Survey WebSite.

The sites documented in the Archaeological Survey of Israel are published on the website where they are displayed in survey squares of 100 sq km (10 × 10 km). The list of maps is presented below in alphabetic order, according to their names and numbers as recorded in Yalqut Ha-Pirsumim. The survey maps can be seen on the right side of the screen against the background of an aerial photograph. The sites (marked with yellow dots) can be accessed by zooming in on the screen and a description of them will appear by clicking on the dots. The introduction to each map and search options are also displayed.



https://survey.antiquities.org.il/index_Eng.html#/



Layers

Published as a book

Published as a book and on the website

Published on the website only

In preparation

Active survey

Field survey completed

Not surveyed

A license was issued but the survey was not conducted

Areas in Jordan and Samaria

MEGA JORDAN

THE NATIONAL HERITAGE DOCUMENTATION and MANAGEMENT SYSTEM

Guest Access

Launch



A State-of-the-Art System for Jordan's Archaeological Sites

MEGA-Jordan is a purpose-built geographic information system (GIS) to inventory and manage archaeology sites at a national level. It has been developed using state-of-the-art technology and requires no more than basic computer skills to enter site and site element boundaries and buffer zones; site details such as condition, threats, and other monitoring updates; and to print out detailed, up-to-date reports on Jordan's vast number of archaeological sites. The system, in both Arabic and English, is web-based and will standardize and centralize data throughout the Kingdom.

<http://megajordan.org/>


Online Databases

<https://pleiades.stoa.org/>

[skip to search form](#)

PLEIADES

[home](#) [places](#) [credits](#) [participate](#) [blog](#) [documentation](#) [downloads](#)



THE GOOD

search for places

Start typing a name, Pleiades ID, or URL

or try an [advanced search](#)



https://survey.antiquities.org.il/index_Eng.html#/


The Archaeological Survey of Israel



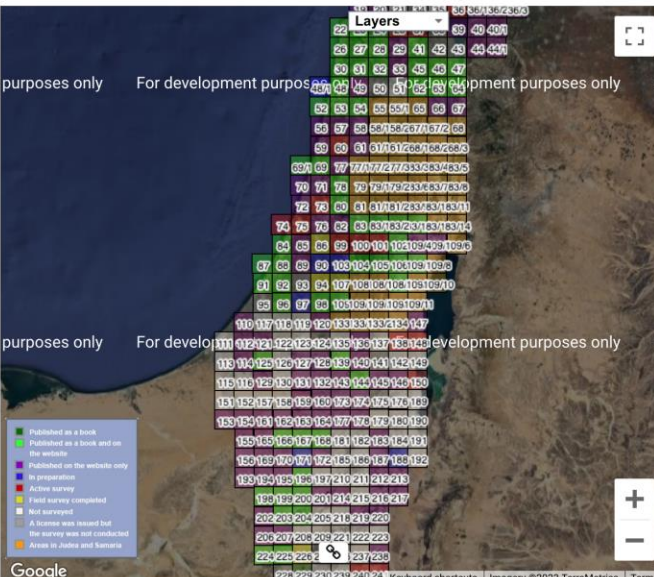
[Home](#) [Map surveys](#) [Development surveys](#) [Golan survey - Intro](#) [Arava survey - Intro](#) [QSearch](#) [Hebrew](#)

Welcome to Israel Antiquities Authority Survey WebSite.

The sites documented in the Archaeological Survey of Israel are published on the website where they are displayed in survey squares of 100 sq km (10 × 10 km). The list of maps is presented below in alphabetic order, according to their names and numbers as recorded in Yalqut Ha-Pirsumim. The survey maps can be seen on the right side of the screen against the background of an aerial photograph. The sites (marked with yellow dots) can be accessed by zooming in on the screen and a description of them will appear by clicking on the dots. The introduction to each map and search options are also displayed.



Agudat Seker Master Shidur



Layers

published as a book

published as a book and on the website

published on the website only

in preparation

Active survey

Field survey completed

Not surveyed

A license was issued but the survey was not conducted

Areas in Jordan and Samaria

MEGA JORDAN

THE NATIONAL HERITAGE DOCUMENTATION and MANAGEMENT SYSTEM

Guest Access

Launch



A State-of-the-Art System for Jordan's Archaeological Sites

MEGA-Jordan is a purpose-built geographic information system (GIS) to inventory and manage archaeology sites at a national level. It has been developed using state-of-the-art technology and requires no more than basic computer skills to enter site and site element boundaries and buffer zones; site details such as condition, threats, and other monitoring updates; and to print out detailed, up-to-date reports on Jordan's vast number of archaeological sites. The system, in both Arabic and English, is web-based and will standardize and centralize data throughout the Kingdom.

<http://megajordan.org/>


Online Databases

<https://pleiades.stoa.org/>

[skip to search form](#)

PLEIADES

[home](#)[places](#)[credits](#)[participate](#)[blog](#)[documentation](#)[downloads](#)



search for places

Start typing a name, Pleiades ID, or URL

or try an [advanced search](#)

https://survey.antiquities.org.il/index_Eng.html#/


The Archaeological Survey of Israel



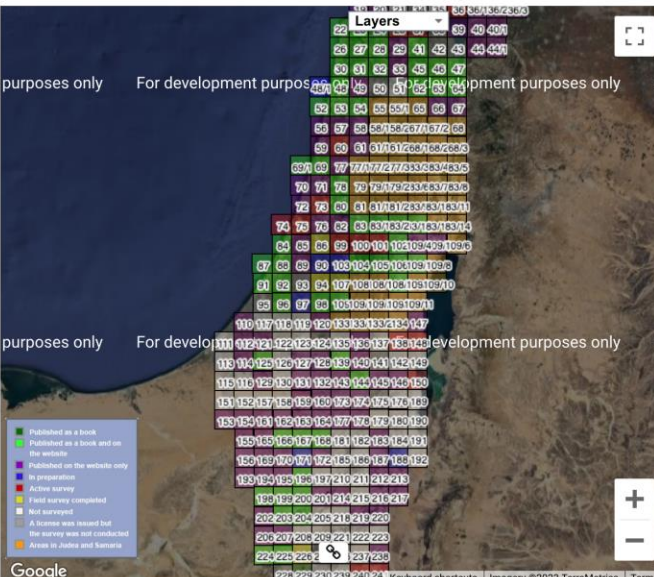
[Home](#)[Map surveys](#)[Development surveys](#)[Golan survey - Intro](#)[Arava survey - Intro](#)[QSearch](#)[Hebrew](#)

Welcome to Israel Antiquities Authority Survey WebSite.

The sites documented in the Archaeological Survey of Israel are published on the website where they are displayed in survey squares of 100 sq km (10 × 10 km). The list of maps is presented below in alphabetic order, according to their names and numbers as recorded in Yalqut Ha-Pirsumim. The survey maps can be seen on the right side of the screen against the background of an aerial photograph. The sites (marked with yellow dots) can be accessed by zooming in on the screen and a description of them will appear by clicking on the dots. The introduction to each map and search options are also displayed.



https://survey.antiquities.org.il/index_Eng.html#/



Legend:

- Published as a book
- Published as a book and on the website
- Published on the website only
- In preparation
- Active survey
- Field survey completed
- Not surveyed
- A license was issued but the survey was not conducted
- Work in Jordan and Samaria



MEGA JORDAN

THE NATIONAL HERITAGE DOCUMENTATION and MANAGEMENT SYSTEM

Guest Access

Launch



THE BAD



A State-of-the-Art System for Jordan's Archaeological Sites

MEGA-Jordan is a purpose-built geographic information system (GIS) to inventory and manage archaeology sites at a national level. It has been developed using modern technology and requires no more than basic computer skills to enter site and site element boundaries and buffer zones; site details such as condition, monitoring updates; and to print out detailed, up-to-date reports on Jordan's vast number of archaeological sites. The system, in both Arabic and English, standardize and centralize data throughout the Kingdom.

<http://megajordan.org/>


Online Databases

<https://pleiades.stoa.org/>

[skip to search form](#)

PLEIADES

[home](#)[places](#)[credits](#)[participate](#)[blog](#)[documentation](#)[downloads](#)



search for places


Start typing a name, Pleiades ID, or URL

or try an [advanced search](#)

https://survey.antiquities.org.il/index_Eng.html#/


The Archaeological Survey of Israel

[Home](#)[Map surveys](#)[Development surveys](#)[Golan survey - Intro](#)[Arava survey - Intro](#)[QSearch](#)[Hebrew](#)

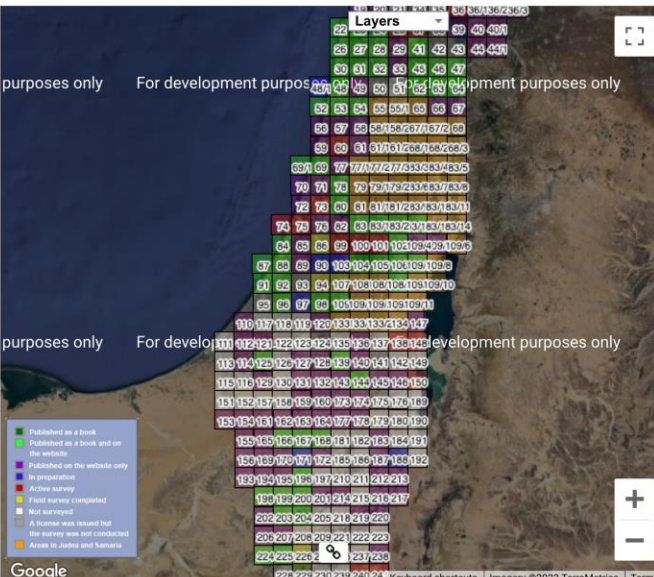


Welcome to Israel Antiquities Authority Survey WebSite.

The sites documented in the Archaeological Survey of Israel are published on the website where they are displayed in survey squares of 100 sq km (10 × 10 km). The list of maps is presented below in alphabetic order, according to their names and numbers as recorded in Yalqut Ha-Pirsumim. The survey maps can be seen on the right side of the screen against the background of an aerial photograph. The sites (marked with yellow dots) can be accessed by zooming in on the screen and a description of them will appear by clicking on the dots. The introduction to each map and search options are also displayed.



https://survey.antiquities.org.il/index_Eng.html#/





MEGA JORDAN

THE NATIONAL HERITAGE DOCUMENTATION and MANAGEMENT SYSTEM

Guest Access

Launch



A State-of-the-Art System for Jordan's Archaeological Sites

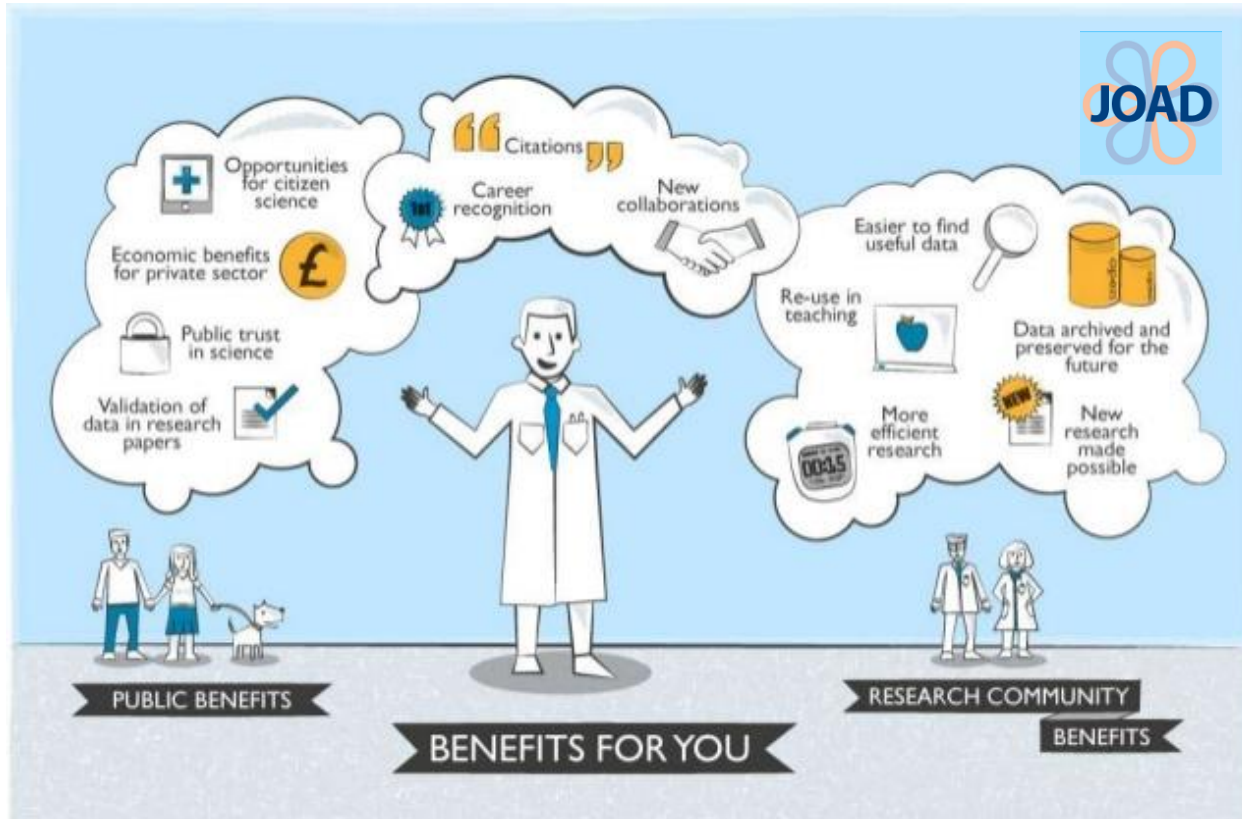
MEGA-Jordan is a purpose-built geographic information system (GIS) to inventory and manage archaeology sites at a national level. It has been developed using state-of-the-art technology and requires no more than basic computer skills to enter site and site element boundaries and buffer zones; site details such as condition, threats, and other monitoring updates; and to print out detailed, up-to-date reports on Jordan's vast number of archaeological sites. The system, in both Arabic and English, is web-based and will standardize and centralize data throughout the Kingdom.

<http://megajordan.org/>



Data Papers

Data papers are designed to make other researchers **aware** of data that is of potential use to them.



- **Description of methodology** with which a dataset was created.
- Description of the dataset itself
- Details about the **potential reuse** of the data.
- Data are **cited** and **re-used**.

Archaeology

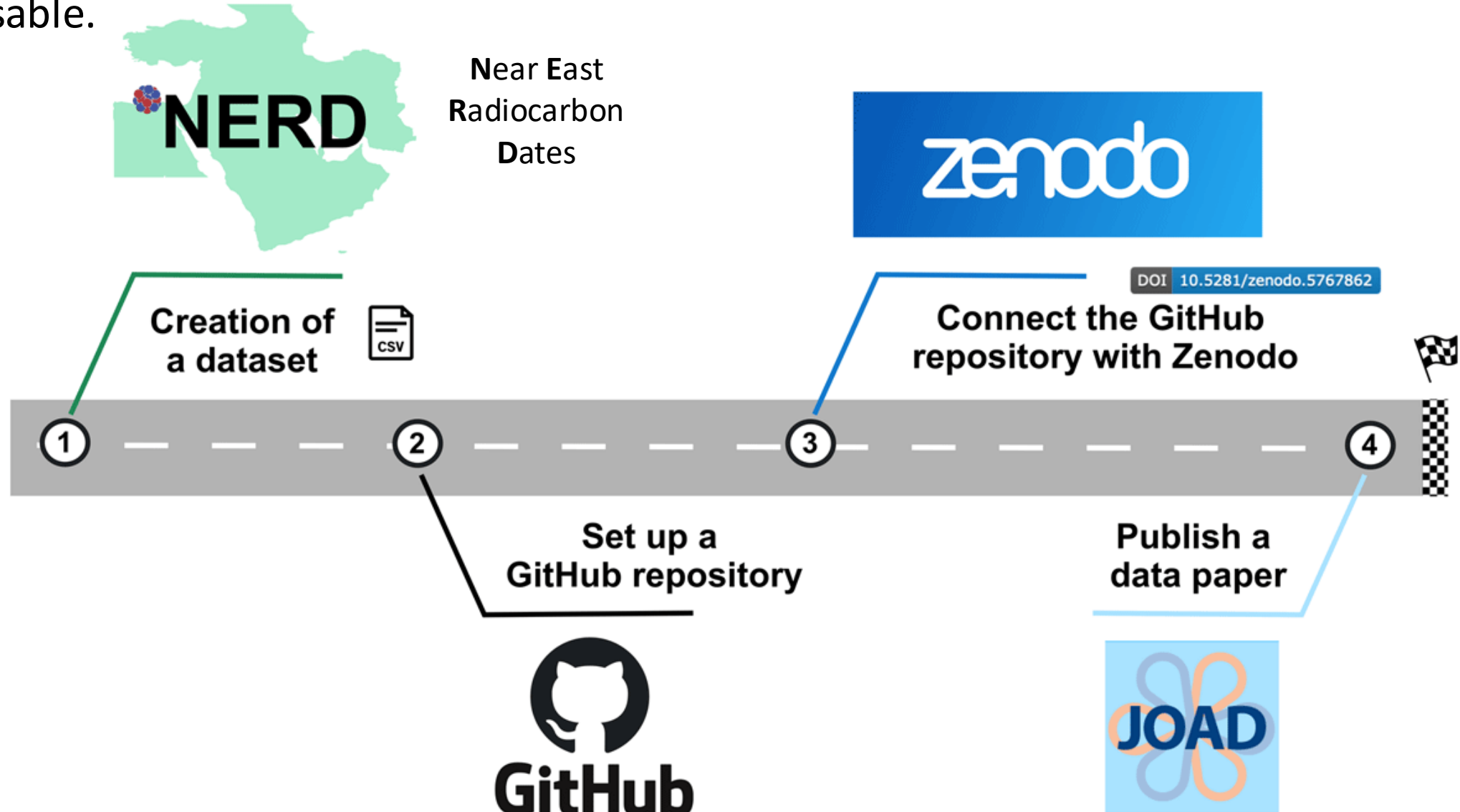
- Journal of Open Archaeology Data (JOAD)
- Archeologica Data

General

- Scientific Data (Nature)

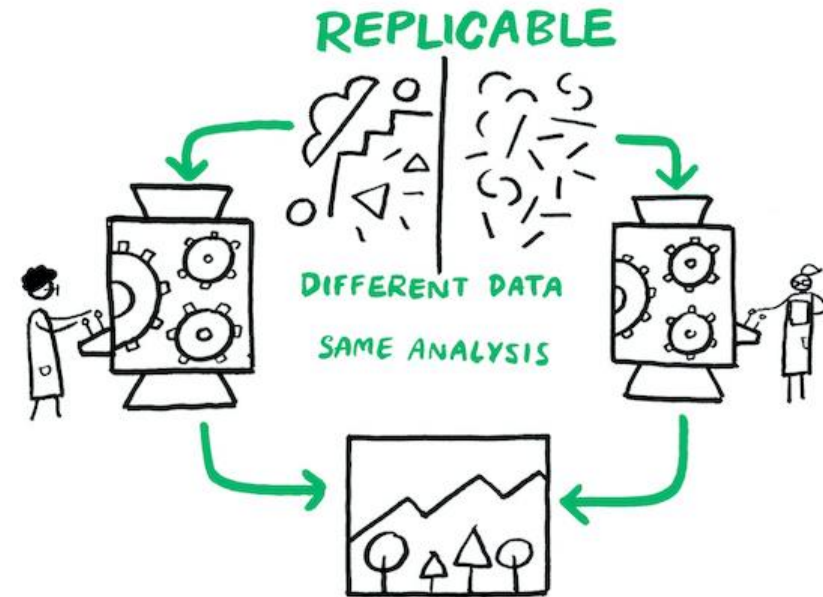
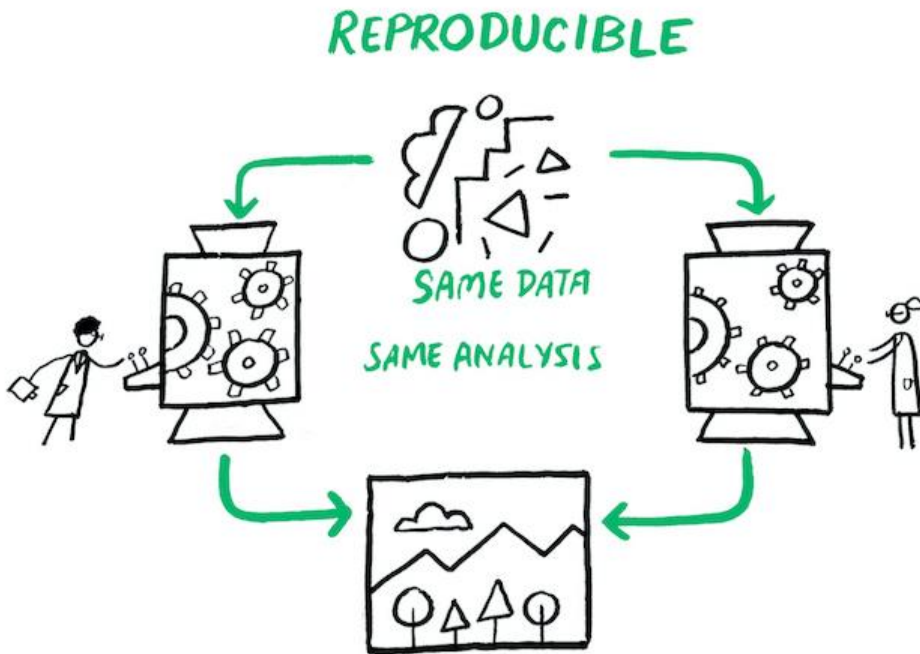
The road map to the FAIR principles

There are several steps that need to be implemented before making our data easily findable and reusable.



Open Methods

- **Reproducible:** A result is reproducible when the *same analysis* steps performed on the *same dataset* consistently produces the *same* answer.
- **Replicable:** A result is replicable when the *same analysis* performed on *different datasets* produces qualitatively similar answers.



State of the Art

A total of **621** publications from four method-based archaeology journals published in **2020-2021**.

- *Journal of Archaeological Science* (n=300)
- *Journal of Archaeological Method and Theory* (n=53)
- *Journal of Computer Applications in Archaeology* (n=30)
- *Plos One* (n=238)

Data	Data Supplementary	Data DOI	Reproducibility
290	215	75	76
46.7 %	34.6%	12.1%	12.2%

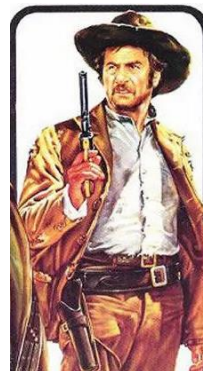
State of the Art

A total of **621** publications from four method-based archaeology journals published in **2020-2021**.

- *Journal of Archaeological Science* (n=300)
- *Journal of Archaeological Method and Theory* (n=53)
- *Journal of Computer Applications in Archaeology* (n=30)
- *Plos One* (n=238)

THE
UGLY

Data	Data Supplementary	Data DOI	Reproducibility
290	215	75	76
46.7 %	34.6%	12.1%	12.2%



State of the Art

A total of **621** publications from four method-based archaeology journals published in **2020-2021**.

- *Journal of Archaeological Science* (n=300)
- *Journal of Archaeological Method and Theory* (n=53)
- *Journal of Computer Applications in Archaeology* (n=30)
- *Plos One* (n=238)

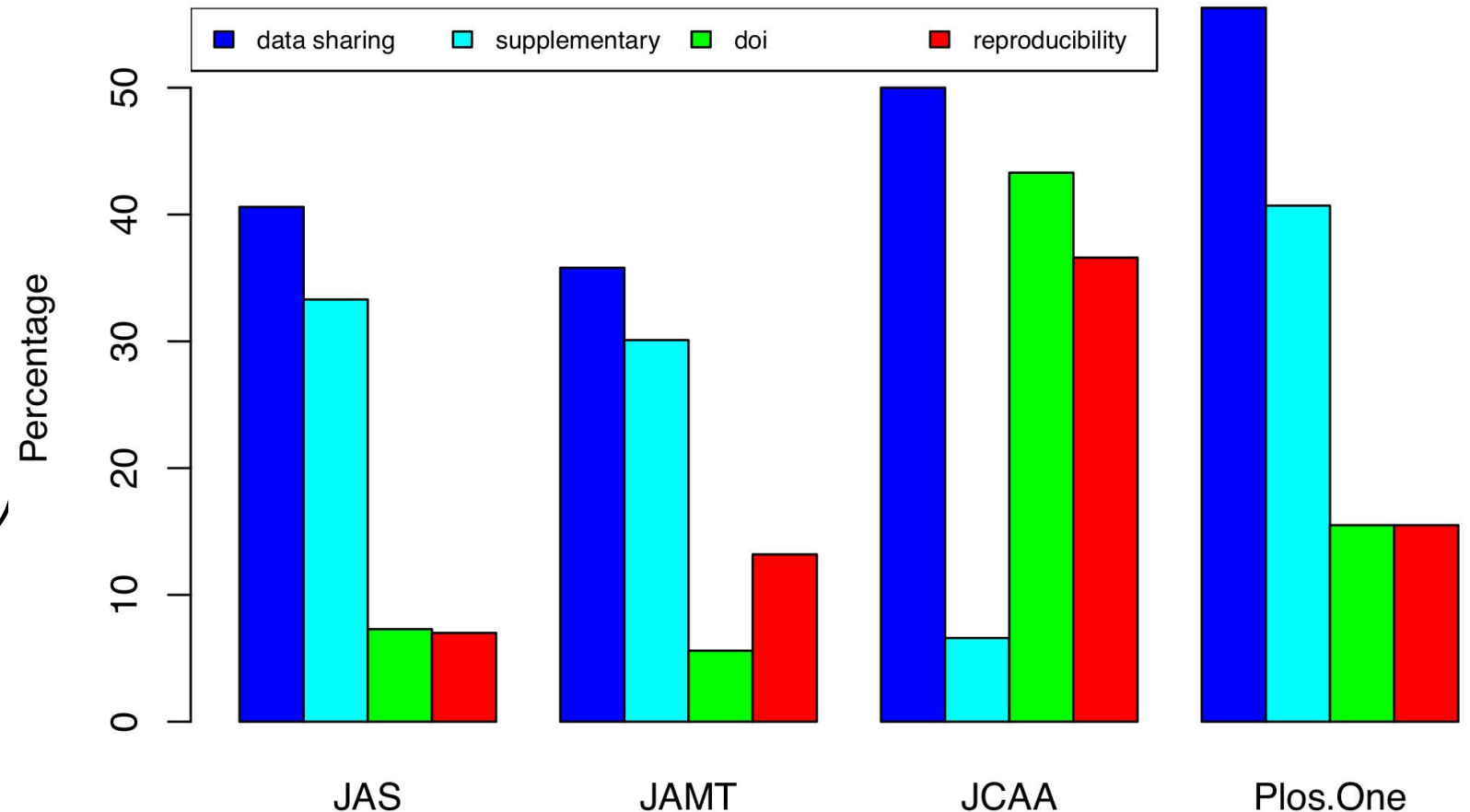
THE UGLY		THE GOOD	
Data	Data Supplementary	Data DOI	Reproducibility
290	215	75	76
46.7 %	34.6%	12.1%	12.2%



State of the Art

A total of **621** publications from four method-based archaeology journals published in **2020-2021**.

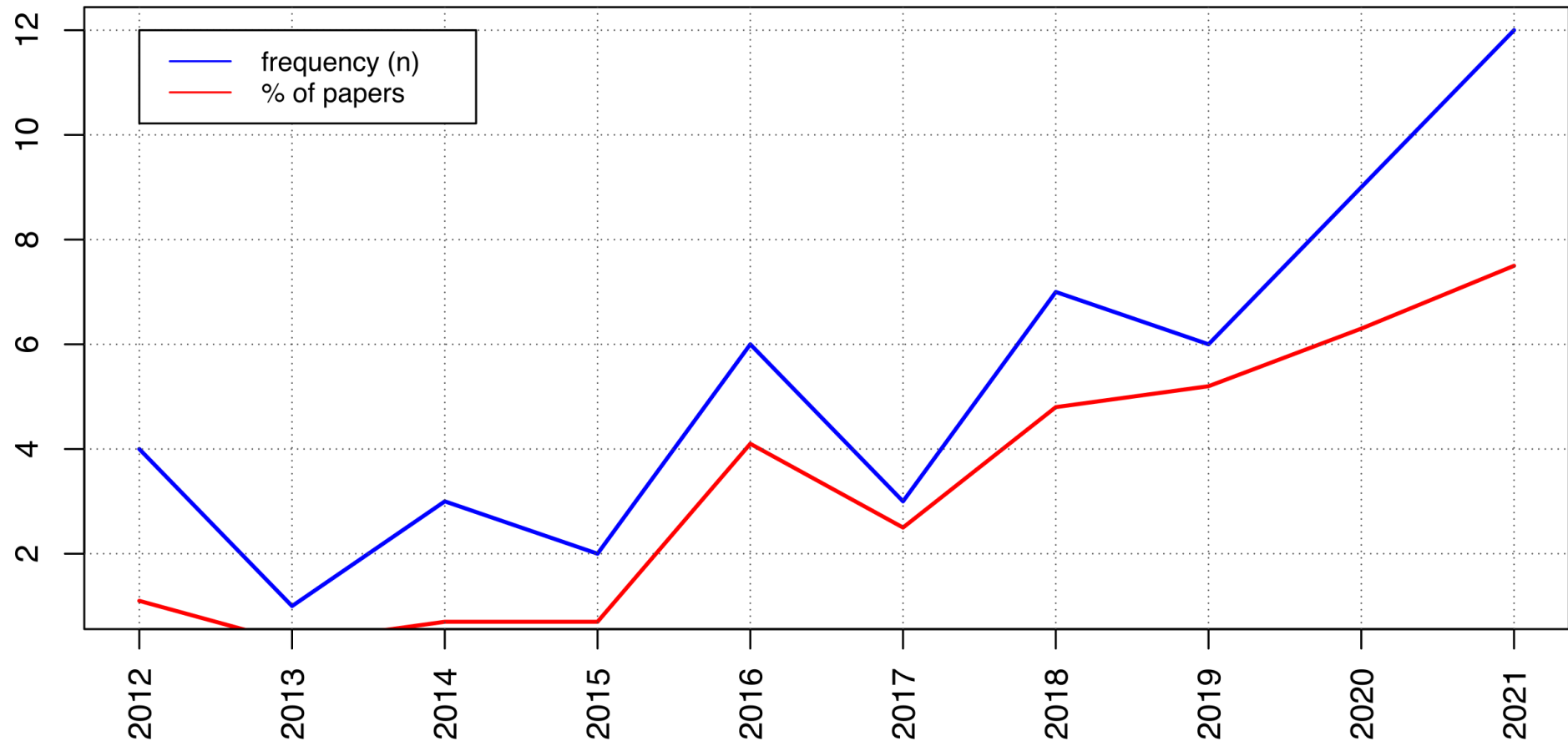
- *Journal of Archaeological Science* (n=300)
- *Journal of Archaeological Method and Theory* (n=53)
- *Journal of Computer Applications in Archaeology* (n=30)
- *Plos One* (n=238)



The Road to Reproducible Research

53 papers out of **2238** published via *Journal of Archaeological Science* (2012-2021) include scripts and instructions for reproducible research.

Journal of Archaeological Science



The Road to Reproducible Research

53 papers out of **2238** published via *Journal of Archaeological Science* (2012-2021) include scripts and instructions for reproducible research.

Journal of Archaeological Science

19 October 2023

JAS Introduces Reproducibility Prize

Acknowledging that reproducibility is a cornerstone of scientific research, JAS has launched a Reproducibility Prize for papers that share in a transparent, clear and detailed manner their data, protocols and/or code. Any paper published at JAS during 2022 (volumes 137-148) was deemed eligible. All Editorial Board members were invited to submit their nominations and the winner was selected based on a majority vote. The prize amounts to \$500 and the winning article gets to be highlighted via Elsevier's social media channels. Moreover, if the winning article is subscription-based, it will be made free to view for a year.





OA Publishing Routes

a  **Gold Open Access**
Payment to Open Access journals or hybrid journals to publish a paper

Green Open Access

No payment for the Open Access dissemination of a paper manuscript

b 
Pre-print manuscript _____
Post-print manuscript _____

c  **Diamond Open Access**
No payment to Open Access journals to publish a paper



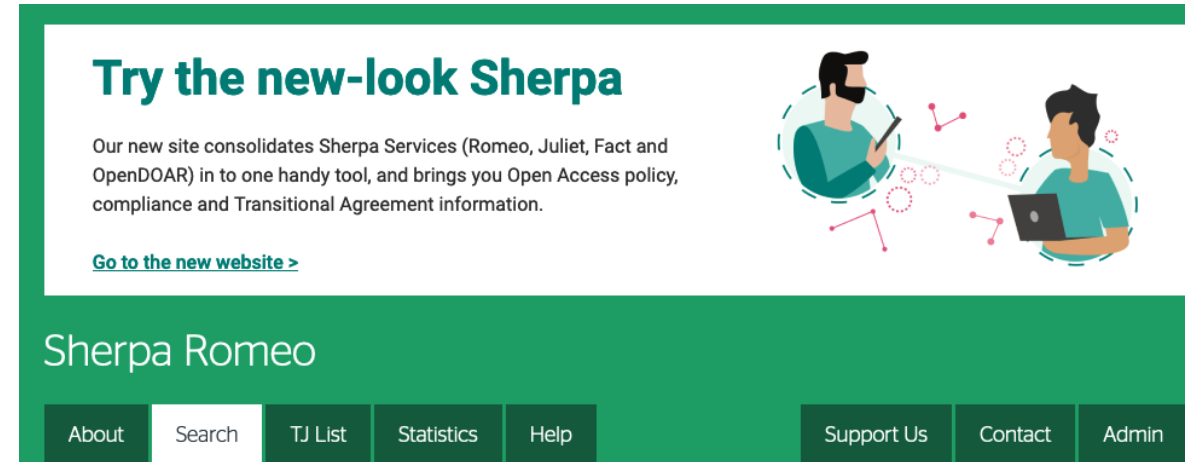
- Pre-print repositories
- Author's homepage
- Institutional repositories

- Author's homepage (no embargo period)
- Institutional repositories (embargo period)



Open publishing


- SHERPA/RoMEO, which is an online resource providing information about copyright and self-archiving policies of academic journals (<https://www.sherpa.ac.uk/romeo/>).
- **Directory of Open Access Journals (DOAJ)** is a website that hosts a community-curated list of open access journals (<https://doaj.org/>).



Try the new-look Sherpa

Our new site consolidates Sherpa Services (Romeo, Juliet, Fact and OpenDOAR) in to one handy tool, and brings you Open Access policy, compliance and Transitional Agreement information.

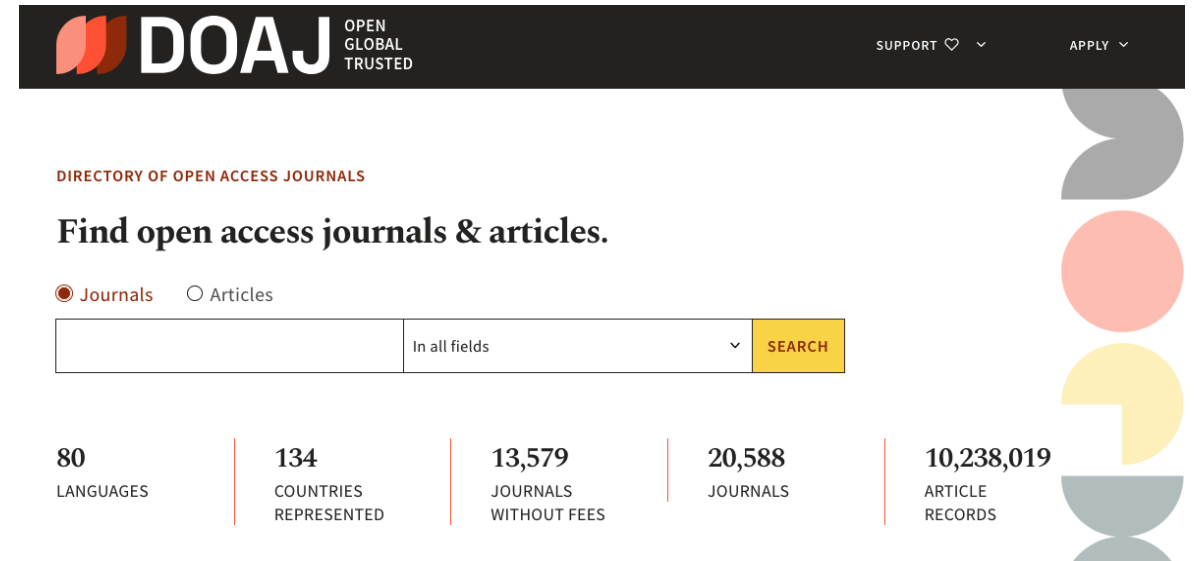
[Go to the new website >](#)



Sherpa Romeo

About Search TJ List Statistics Help Support Us Contact Admin

Welcome to Sherpa Romeo



DOAJ OPEN GLOBAL TRUSTED

SUPPORT ♥ APPLY


DIRECTORY OF OPEN ACCESS JOURNALS

Find open access journals & articles.

☒ Journals ☐ Articles


In all fields

80 LANGUAGES	134 COUNTRIES REPRESENTED	13,579 JOURNALS WITHOUT FEES	20,588 JOURNALS	10,238,019 ARTICLE RECORDS
-----------------	---------------------------------	------------------------------------	--------------------	----------------------------------

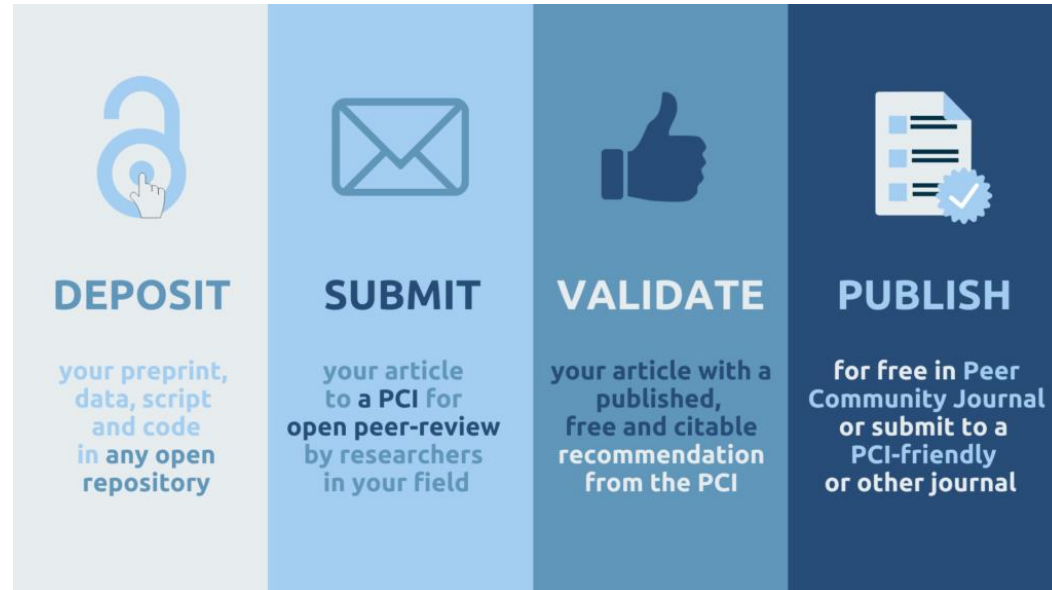


The road map to the FAIR principles

1. Manuscripts freely available online as preprints:



- SocArXiv 
- SSRN 

2. Disciplinary **communities** providing **peer review** services validating **preprint** to to give them the same value as articles published in traditional journals.

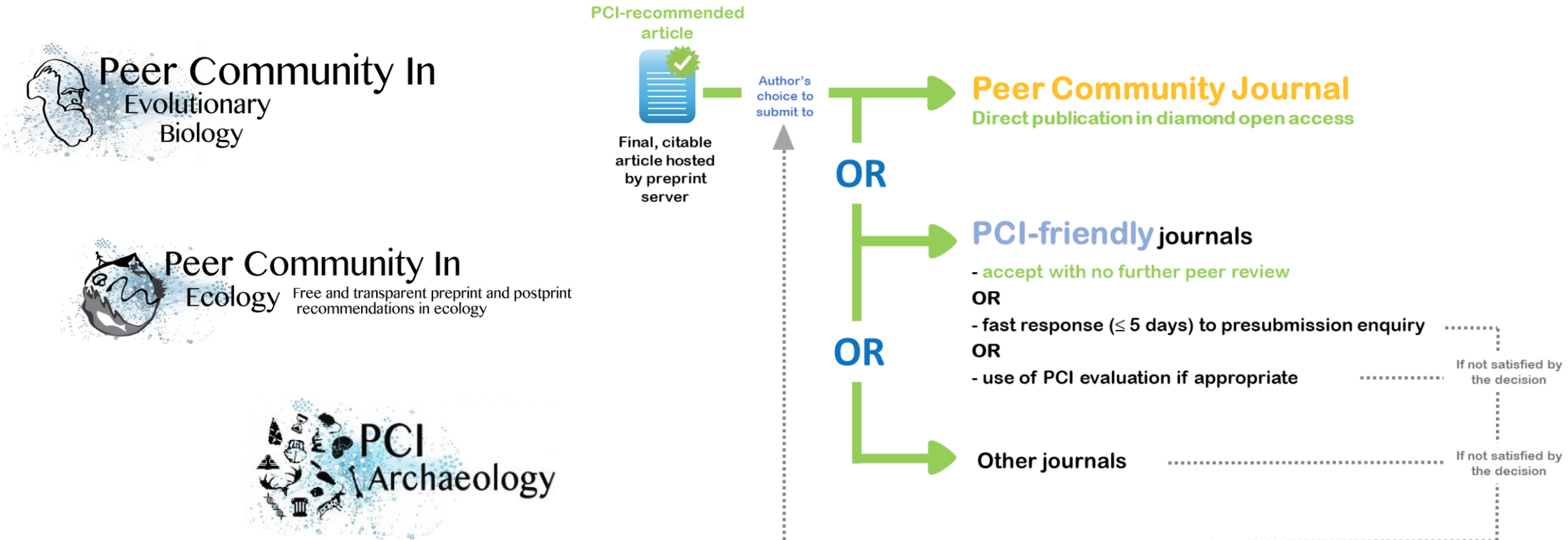


The road map to the FAIR principles

1. Manuscripts freely available online as preprints:

- SocArXiv 
- SSRN 

2. Disciplinary **communities** providing **peer review** services validating **preprint** to to give them the same value as articles published in traditional journals.



Ethical Issues

Academic research issues

- large datasets citing pre-existing sources
- Practices of data-hoarding
- Unequal access to Gold open access

SOLUTIONS

- Sharing of datasets under two kinds of licenses:



Share — copy and redistribute the material in any medium or format for any purpose, even commercially.

Adapt — remix, transform, and build upon the material for any purpose, even commercially



Share — copy and redistribute the material in any medium or format for any purpose, even commercially.

ShareAlike — If you remix, transform, or build upon the material, you must distribute your contributions under the **same license** as the original.

Under the following terms:



Attribution — You must give appropriate credit

Ethical Issues

Research field issues

- Exposure of archaeological sites to looting
- Digital colonialism
- Underrepresentation of social groups (e.g. indigenous communities)

SOLUTIONS

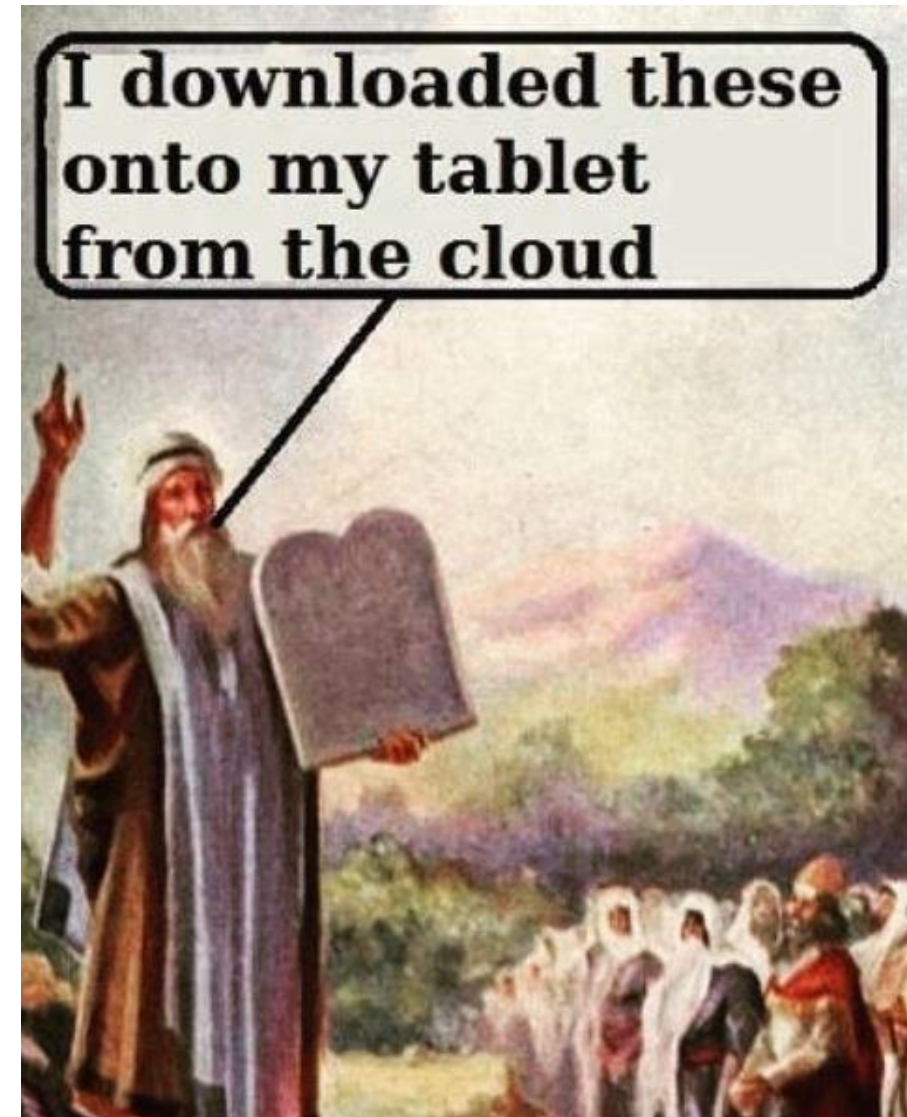
- Restricted access to sensitive materials
- Developing of participatory policies
- Engagement of local communities

What is next?

- More **transparency** and **equity** in data and publication sharing practices.
- Making accessible **reproducible** workflows.
- Depositing data and codes for analyses in **open access repositories**.
- **Teaching** at undergraduate level practices of data sharing and reproducibility.
- Developing an international **protocol**.

A decalogue of OS practices

- 1) Publish scholarly work **electronically**.
- 2) Deposit data in an online, freely accessible **repository** with a persistent **DOI**.
- 3) Store data in its most **unprocessed state** possible.
- 4) Utilize **open formats** for data storage to ensure interoperability (e.g. CSV, PNG, SVG, GeoJSON).
- 5) Accompany the corresponding dataset with relevant **metadata**.
- 6) Disseminate data under an **open license** (CC0, CC-BY).
- 7) Enhance research **reproducibility** by providing raw data and a detailed workflow.
- 8) Publish a **data paper**.
- 9) Publish your article through "**Diamond Open Access**" or "**Green Open Access**" options.
- 10) Consider "**Gold Open Access**" publication only in fully open-access journals.





Thank you

USEFUL LINKS

Paper from Journal of Open Archaeology Data

<https://openarchaeologydata.metajnl.com/articles/10.5334/joad.90>

Repository of the matching dataset: <https://zenodo.org/records/5767862>

Example of dataset's structure for sharing data and reproducible research:

<https://zenodo.org/records/4322979>

Practical 1

A researcher asks for your assistance in disseminating his data online and provides you with his digital archive.

- Did you notice any issue in the provided dataset?
- How would you proceed to make the dataset adhering to the FAIR principle?

Discuss it in a group and modify the original dataset so that it adheres to international standards.

Practical 2

What would you do to publish your your paper **Green Open Access**?

Scenario 1: the paper is under review in the journal *Nature*

Scenario 2: the paper has ben accepted and published on *Nature*

Discuss about it and provide some solutions.